

rec'd. Oct./59


P.S.
Ro
605
1958-
1959
AR

PROGRESS REPORT

FOR THE YEAR ENDED JUNE 1959

LIFE SCIENCES DIVISION

ROYAL ONTARIO MUSEUM



Digitized by the Internet Archive
in 2019 with funding from
Royal Ontario Museum

<https://archive.org/details/annualreportofro59roya>

ROYAL ONTARIO MUSEUM

LIFE
SCIENCES
DIVISION

PROGRESS REPORT

FOR THE YEAR

ENDED

JUNE 1959

Editor: R. L. PETERSON, PH.D.

Design: FRANK NEWFELD, M.T.D.C., N.D.D.

CONTENTS

Staff, 2

Introductory Remarks, 4

Department of Fossil Vertebrates, 6

Department of Mammals, 8

Department of Birds, 10

Department of Ichthyology and Herpetology, 14

Department of Fossil Invertebrates, 18

Department of Invertebrates, 20

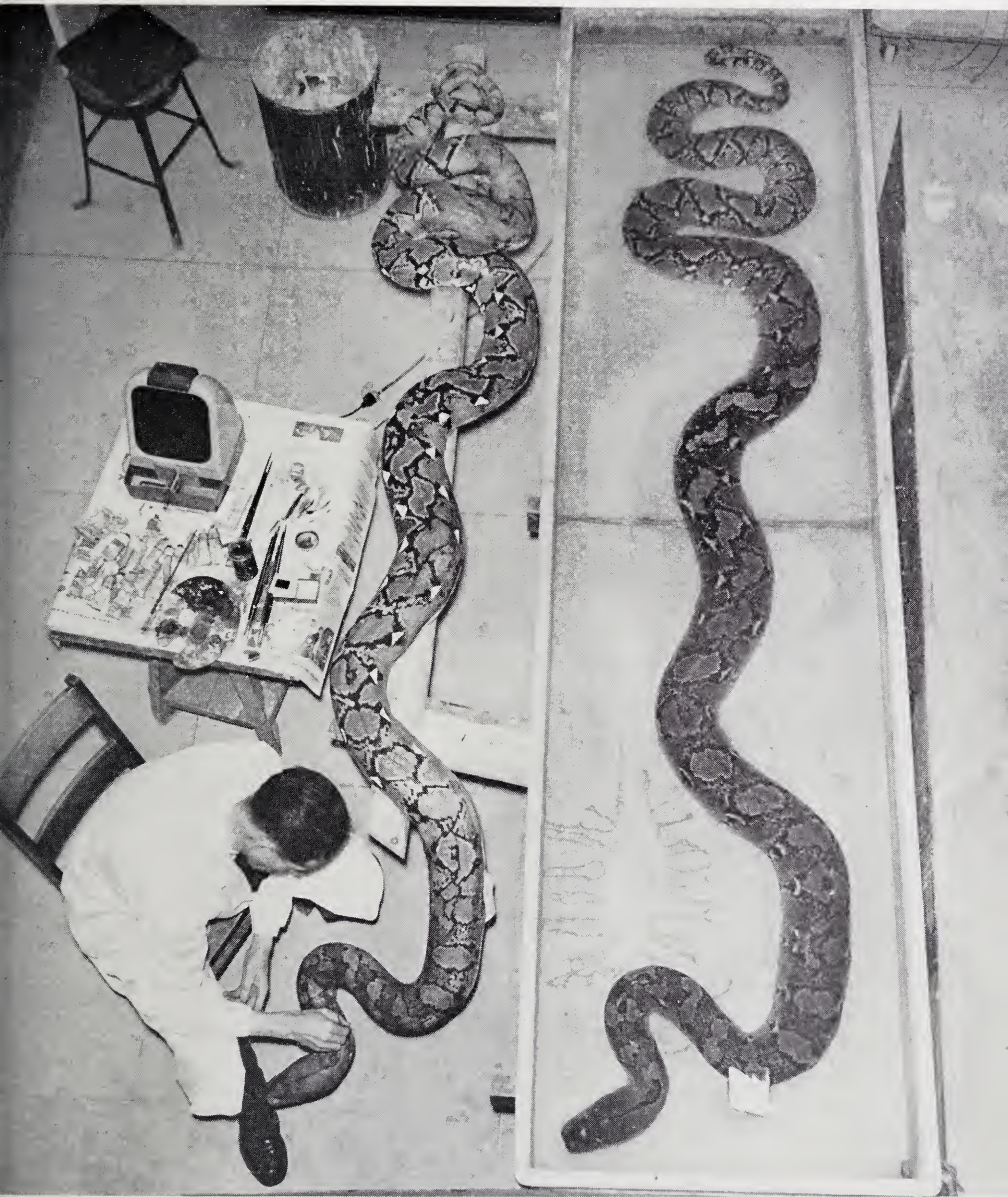
Department of Arts and Exhibits, 22

Library, 25

Chief Technicians, 26

Staff Publications, 28

One of the feature exhibits in the forthcoming Gallery of Modern World Reptiles will be a cast of an eighteen-foot Reticulated Python. The accompanying photograph shows the actual preserved specimen immersed in the tank at the right, and the cast, made of a latex compound, on the left. The mould for this cast, at one stage of its preparation, weighed nearly three-quarters of a ton. In the course of the moulding and casting procedure a unique transfer process imparts the basic pattern of the snake to the cast. This ensures the accuracy of markings which may be observed in the photograph. The true colours of the snake are then applied with artists' oil colours with reference to colour sketches and Kodachromes.



PERMANENT STAFF

NON-DEPARTMENTAL

F. A. Urquhart, M.A., Ph.D., Head
Mrs. Mary Fee, Secretary
Miss E. J. McCormick, B.A., B.L.S., Special Librarian
Miss Barbara Rosser, Stenographer (resigned June 30, 1959)
R. R. Hornell, Chief Technician (Paleozoology)
E. H. Taylor, Chief Technician (Zoology)
G. Pyzer, Attendant and Storekeeper (retired July 1, 1959)

DEPARTMENT OF FOSSIL VERTEBRATES

L. Sternberg, Associate Curator
G. Edmund, M.A., Ph.D., Assistant Curator
Miss E. N. Hammell, Research Assistant

DEPARTMENT OF MAMMALS

R. L. Peterson, Ph.D., Curator
S. C. Downing, B.A., Curatorial Assistant

DEPARTMENT OF BIRDS

L. L. Snyder, Curator
J. L. Baillie, Curatorial Assistant

DEPARTMENT OF AMPHIBIANS AND REPTILES

E. B. S. Logier, Associate Curator

DEPARTMENT OF FISHES

W. B. Scott, Ph.D., Curator
E. J. Crossman, M.A., Ph.D., Assistant Curator

DEPARTMENT OF FOSSIL INVERTEBRATES

R. R. H. Lemon, M.A., Ph.D., Assistant Curator
J. Monteith, Research Assistant

DEPARTMENT OF INVERTEBRATES

F. A. Urquhart, M.A., Ph.D., Curator
G. B. Wiggins, M.A., Ph.D., Assistant Curator
E. M. Walker, M.B., F.R.S.C., Honorary Curator

DEPARTMENT OF ART AND EXHIBITS

T. M. Shortt, Chief
A. Gatti, Artist

TEMPORARY AND PART-TIME STAFF

EXTRA CLERICAL

NON-DEPARTMENTAL

Ralph Rae

DEPARTMENT OF MAMMALS

K. S. Pogany

J. Bristol Foster

Allan A. Outram

DEPARTMENT OF BIRDS

J. Woodford

Laszlo Szijj

DEPARTMENT OF FISHES

Mrs. Nina McFarland

John Cooper

John Sweet

William Charlton

Allen Wanio

Hugh McCallum

William Beamish

Don Woodman

DEPARTMENT OF INVERTEBRATES

Miss Hilda White

David Barr

K. S. Pogany

W. H. Carrick

DEPARTMENT OF ART AND EXHIBITS

John Walter

Umberto Grassi

LIBRARY

Mrs. Elizabeth Ireland

CHIEF TECHNICIANS

Peter Buerschaper

Kenneth Zurosky

David Scolland

Ronald Nye

INTRODUCTORY REMARKS

During the past four years the Museum has undergone a number of organizational changes, of which the nomenclature of the various museums involved has been most noticeable. Our earlier reports appear under the name of the "Royal Ontario Museum of Zoology." With the amalgamation of Zoology and Palaeontology it was changed to the "Royal Ontario Museum of Zoology and Palaeontology." As the result of the appointment of a single Director of the Royal Ontario Museum, the name was again changed to the "Division of Zoology and Palaeontology." By combining the sciences of Zoology and Palaeontology, a natural division was created, namely life science. It was therefore suggested that in place of the rather cumbersome title of "Zoology and Palaeontology" the more popular and euphonious title "Life Sciences" be adopted. This suggestion received the approval of the Museum Board during the past year, and hence our divisional name is "Life Sciences Division." It is our sincere hope that eventually systematic botany will be added, so that the term Life Sciences will include plant and animal life of the past and present.

In keeping with the popular terminology "Life Sciences," the names of the various departments have been changed, as, for example, "Department of Birds" instead of "Department of Ornithology" and so on.

Although the Department of Fossil Invertebrates was without a full-time curator during the past year, we were most fortunate in having Dr. Lemon, who was on the staff of Queen's University, devote his free week-ends to continue the work of this department. We are indeed pleased to have Dr. Lemon on our staff again as Assistant Curator in charge of this department.

Our library of Systematic Zoology and Palaeontology is one of the largest and most important in Canada. Because of its use not only to the students and the members of the staff of the University of Toronto but also to research workers in institutions throughout the world, it was agreed that it should be recatalogued according, in part, to the Library

of Congress system, and that the publications housed in several separate departments be brought together into one large central room. Having received assurance that the necessary money would be made available for this purpose, the above plan was put into effect. We are hoping that the task will be completed during the next five years.

As in the past, a great deal of the time of the Curators has been spent on personal research and assisting in the research of others. Dr. R. L. Peterson continued his studies of the Mammals of Eastern Canada; Mr. L. L. Snyder has added many pages of manuscript to his work on Ontario Birds; Mr. E. B. S. Logier is revising his check list of the Amphibians and Reptiles of Canada, as well as continuing the preparation of a manuscript on the Reptiles of Eastern Canada; Dr. E. M. Walker is well along the way to completing Volume 3 of the Odonata of Canada and Alaska; Dr. A. G. Edmund completed the manuscript on Tooth Replacement of Reptiles with particular reference to Dinosaurs; the manuscript on the Monarch butterfly research was completed and will be published during the next University year; Dr. Scott and Dr. Crossman completed their studies, and published the results, on the Fishes of New Brunswick; Dr. Wiggins has nearly completed his study of the Phryganeidae of the World, and prepared two other papers for publication. In all it has been a most satisfactory research year.

The Art staff concentrated their entire attention on the preparation of material for the Gallery of Reptiles. This made it necessary for staff members, other than the regular Art staff to assist in gallery displays. Dr. A. G. Edmund deserves special mention for assisting in this manner by preparing a special exhibit dealing with the tar deposits of Peru; this he did at the expense of his own research and the work of his department.

I have not attempted to summarize the work that has been accomplished in each department because such information is outlined in the individuals reports. In commending these reports to you, I would point out that a Museum of Science should balance research and education so that each carries on a continuous and fruitful programme. This I feel we have accomplished during this past year.

F. A. Urquhart, HEAD

DEPARTMENT OF FOSSIL VERTEBRATES

The main accomplishments have been the completion of the manuscript and illustrations for two technical papers by the assistant curator. With three hundred typed pages and sixty pages of illustrations, "Mode and Sequence of Tooth Replacement in Reptiles" should provide a basic reference work in its field. "Evolution of Dental Patterns in Lower Vertebrates" will be read at the June meeting of the Royal Society of Canada. Work on tooth replacement studies should be almost concluded this year with the preparation of a paper on the crocodilia.

The opening of the Peruvian exhibit by the Peruvian ambassador highlighted the exhibition programme this year. A 900-foot, 16-mm. colour moving picture illustrating field and laboratory methods used in the Peruvian project was prepared and presented with an address by Dr. Edmund at the opening. Integrated with the existing display from the California tar pits, four table cases, three wall cases and two miniature dioramas tell the story of the occurrence, collecting and recovery of materials from the Peruvian site. Numerous 16 in. \times 20 in. photographs were used to illustrate the exhibit. Because of urgent commitments elsewhere, the regular exhibition staff could not prepare this exhibit. The Assistant Curator wishes to thank all who lent their time and talents to make this attractive modern display possible. Judging from Sunday crowds, it has been well received by the public.

Work on the Peruvian collection is progressing rapidly, but only about one-quarter of the material has been prepared to date. Dr. C. S. Churcher of the Department of Zoology of the University has been active in sorting the mammalian remains, and has begun detailed work on the wolves and foxes. As a research associate, Dr. Churcher is performing a valuable service to this Museum, and merits not only praise, but also adequate facilities to continue his work.

Dr. Edmund has supervised cataloguing, cleaning and sorting the Peruvian collection, and the Research Assistant, Miss E. N. Hammell, has compiled bibliographies on Pleistocene fossils as well as cataloguing

and cleaning numerous lots of small bones. The reprint collection has been reorganized to include the valuable material purchased from the libraries of Drs. Lull and Wieland of Yale.

Lectures were given to students in the Department of Zoology of the University, and of the College of Optometry, and to the general public in the Darwin Centennial series, and through the Workers' Educational Association. Television shows featured the origin and evolution of life of the earth, evolution of the horse, and the evolution and extinction of animal species.

The Assistant Curator attended the Montana Field Conference of the Society of Vertebrate Paleontology, the Annual Meeting of the Society of Vertebrate Paleontology at Ann Arbor, and the Annual Meeting of the American Society of Zoologists at Washington, where he presented a paper on the major principles of tooth replacement in the lower vertebrates. The only field work of the year was a trip to the Suffield Experimental Station at Ralston, Alberta, where several outcrops were visited and specimens identified for local collectors. No important specimens were added to our collections, although the area deserves further study.

Other activities of the Assistant Curator included participation in a committee for the conception of a museum magazine, in another committee concerned with reorganization of the library, and routine matters such as administration and identification of numerous specimens from the public. A centre for the preparation of illustrations has been fairly well equipped, but proper quarters are still lacking. Storage space for the Peruvian material is again becoming critical, and new quarters must be found. A reorganization of space on the mezzanine floor, with the co-operation of the Department of Fossil Invertebrates, is anticipated and this should afford at least temporary relief.

DEPARTMENT OF MAMMALS

Special emphasis was again placed on the preparation of the manuscript for "The Mammals of Eastern Canada." Draft copy has been completed for all species up to the carnivores. Only the balance of this group plus the Artiodactyla remain to be completed. The services of Mr. S. Pogany were utilized during the year to prepare detailed line drawings of the skulls of the species covered by this work. A total of 73 species have been completed to date. Considerable time was spent on the preparation of detailed distribution maps for each species. All available records of specimens that have been taken from eastern Canada are being recorded and plotted on base maps. In addition to our own collections and published records, visits were made to most of the larger research collections containing eastern Canada material where detailed records were made.

The Curator was recently appointed chairman of the Life Sciences Exhibit Committee, and also chairman of the Editorial Committee for the scientific publications of this Division. Studies in connection with these two activities were combined with research on eastern Canadian mammals during visits to the following institutions: Rochester Museum of Arts and Science, Rochester, New York; Department of Conservation, Cornell University, Ithaca, New York; New York State Museum, Albany, New York; Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; American Museum of Natural History, New York City; Philadelphia Academy of Natural Science, Philadelphia, Pennsylvania; Carnegie Museum, Pittsburgh, Pennsylvania; Cranbrook Institute, Bloomfield Hills, Michigan; Museum of Zoology, University of Michigan, Ann Arbor, Michigan; Museum, Michigan State University, East Lansing, Michigan; Chicago Natural History Museum, Chicago, Illinois; Milwaukee Public Museum, Milwaukee, Wisconsin; and Department of Forestry and Conservation, University of Wisconsin, Madison, Wisconsin. A forthcoming visit to the United States National Museum, Washington, D.C., will complete the planned programme of research at other institutions.

During the summer of 1958 the Curator carried out field studies along the north shore of the St. Lawrence River as far northeast as Godbout and south across the Gaspé Peninsula to Prince Edward Island, northern Nova Scotia and New Brunswick.

Routine curatorial work centred around the processing of the J. A. Munro collection of mammals which is proving to be an exceptionally fine addition. Sorting of specimens, association of skins and skulls was carried out and cataloguing is well under way. Temporary housing of the collection has been necessary although provisions were made to construct two new large specimen cabinets which have been seriously needed. Other additions to the collection were at a low level with only 178 specimens added including 59 by staff collecting and 119 by donations. Of the latter, a collection from Manitoba donated by Dr. J. R. Tamsitt was perhaps most significant.

Some much needed curatorial assistance was received through the services of Mr. J. B. Foster during the late winter months of 1959 and through the gratis services of Mr. A. A. Outram, who was able to assist a few days each month of the same period.

A general maintenance and construction programme was made possible through the services of Mr. Rae which permitted us to repair the osteological cabinets, build storage shelving, a portable combination blackboard and map stand, extra trays for both large and small specimen cabinets and two complete large specimen cabinets.

Over one thousand preserved small mammals were identified for the province-wide survey carried out by the Research Division of the Ontario Department of Lands and Forests. Other routine identifications were made for many individuals and institutions including archaeological material for the Division of Art and Archaeology.

Lectures by the Curator included Zoology 25 Course for the University Department of Zoology, a series on biology for the Workers Educational Association and the Darwin Centennial Lecture Series.

Routine conferences, consultations, editing and other assistance to colleagues, students and the general public continued at a high level. Assistance was given the National Film Board in their educational film-strip series. Appearances were also made on radio and television in connection with mammal studies.

The Curator also attended the annual meeting of the American Society of Mammalogists at Tucson, Arizona where he was again elected as Recording Secretary.

DEPARTMENT OF BIRDS

In the report for last year mention was made of the acquisition, by purchase, of the collection of the late J. A. Munro of Okanagan Landing, British Columbia. Completion of this transaction occurred during the present fiscal year. Before remarking on the importance of this collection, it is well to record that receipt of the collection culminates occasional discussions with Mr. Munro over a period of ten years or more. It is, therefore, very gratifying that the Trustees found it possible to finalize the matter.

Further comments, on events pertaining to the Munro transaction, should be mentioned. Details were finalized on July 28, 1958. Mr. Munro's letter under that date expressed his complete satisfaction, he having long entertained the hope that it would remain in Canada. He offered to make good any damage to specimens suffered in transit and it is pleasant to report that there was not a single case of damage to the 8,461 bird specimens involved. It is evident Mr. Munro had exercised the same meticulous care in transmitting the collection as he had in preparing the specimens originally. It is with deep regret to have to record here that Mr. Munro died in Ottawa on September 29, 1958.

J. A. Munro was a senior (retired) wildlife specialist. For many years he was the representative of a Federal Department concerned with wildlife in British Columbia. He had contributed extensively to ornithological literature.

The Munro collection is widely representative (312 genera; 594 species), clean and durable. Anyone familiar with comparative investigations knows the handicap, or even the impossibility, of making correct interpretations from carelessly prepared material. All the economies of space, the forethought for use, the processing for conservation have been applied. Though fundamental, these matters are not the overriding features of the collection. J. A. Munro had the acumen to seek and save desiderata which could be brought to bear on countless scientific questions.

Wide geographic representation in museum collections is essential to reveal the minor population variations associated with environment. The Munro collection is primarily western in origin—British Columbia particularly, and to a lesser extent, western United States. Our holdings for this region are now greatly improved.

A detailed understanding of normal development and sequence of plumage among birds is best approached by a study of selected museum specimens. The Munro collection contributes strongly in this direction. As an example, mention should be made of a series of skins of the small duck *Bucephala albeola*, known as the Bufflehead. Munro's series is probably the most complete in existence. Further, with respect to the labyrinth of questions pertaining to plumage variation, there are those which correlate with season, with sex, and others. The Munro collection supplies data of this sort in abundance.

Of both scientific and practical interest is the fact that game birds constitute approximately 15 per cent of the whole. These are important because of wide concern with and general development of management of this element of our avifauna. Man should know well those things he wishes to manage. The Munro collection is rich and timely in this regard and it might be added, not easily duplicated for the simple reason that game birds are more often plucked and eaten than preserved for science.

The foregoing should be adequate to reveal that the Munro collection is a major accession to the Department. It is useful now and will remain so for a long, long time. It will reveal to ornithologists of the distant future, the discernment and curatorship of the man who brought it together and the wisdom of our Trustees in seeing that it came to this museum. It is not inappropriate to add that few such opportunities are likely to arise again since the day of the private museum is passing. Other accessions during the current year which should be mentioned are as follows:

By donation—2 specimens of the extinct Passenger Pigeon, 1 from Mr. L. H. Beamer of Meaford, and 1 from Mr. Paul Hahn of Toronto, who has been instrumental in securing 69 of our 124 total; 2 specimens of the extinct form of the Greater Prairie Chicken ("Heath Hen") by Mr. William Steele of Guelph; and 48 skins of Ontario birds by Mrs. William Dean of Toronto. Four specimens in the flesh, representing unusual Ontario occurrences were donated by the Ontario Department of Lands and Forests.

By Purchase—83 skins from Montmagy and Kamouraska counties, P.Q., from Mr. Raymond McNeil.

By exchange—15 skins from the University of Florida; 16 skins from Zoologisch Museum, Amsterdam, Netherlands; 17 skins from the National Museum of Victoria, Melbourne, Australia; and 11 skins from the British Museum (Natural History) London, England.

One accomplishment during the year which is particularly helpful in view of congestion in the Department's physical plant has been the reduction of approximately 50 mounted specimens of scientific importance to study skins. These were done as piece-work by experienced preparators not on the staff. Mr. Taylor serving as part-time technician for the Department has made 51 preparations during the year. Mr. Baillie, Curatorial Assistant, has catalogued 384 specimens, made an inventory of the Munro collection, placing it in temporary storage, and made an inventory of our osteological holdings. Extra clerical funds have made it possible to proceed with bibliographic work imperative to the programme of the Curator. Thus Mr. James Woodford, a student of the University, working part-time has prepared some 3,400 reference cards.

Study of Ontario material has been continued by the Curator in connection with the preparation of a systematic treatise on that subject. Use of the collection by other workers continues to be an important activity. A graduate student of the University of Toronto and another from the University of California were provided with facilities for study and specimen examination in the bird room and a total of 55 additional names have been registered, mostly of local bird students who have referred to the collection during the year. In addition, specimens have been loaned to researchers, representing other institutions or as individuals as follows: 59 skins to the National Museum of Canada, Ottawa; 162 eggs to the Carnegie Museums, Pittsburgh; 47 skins to the University of Cincinnati; 98 skins to Mercer University, Macon, Georgia; 1 specimen to Cornell University, Ithica; 1 specimen to the Illinois Natural History Survey, Urbana; 26 skins to the Ontario Bird Banding Association, Toronto; 4 skins to Mr. Hamilton Laing, Comox, B.C.; 3 skeletons to Mrs. Doris Speirs, Toronto.

Other activities which indicate both the varied activities of the staff and the scope of service rendered during the year are here reported in brief and in part. Both the Curator and the Curatorial Assistant attended the 75th Stated Meeting of the American Ornithologists' Union in New York, the former being elected member of Council for the next two years. The Curator had the pleasure of introducing a group of field officers of the Ontario Department of Lands and Forests to the bird room and to the work carried on there. He also was pleased to welcome the President and Vice-President of the University of Toronto and the Director of the Museum to the bird room to outline the scope and purposes of the collection. Mr. Baillie gave a series of eight lectures on bird study to an evening Tutorial Class, University Extension, and six additional talks to local organized groups and on radio programmes. The Curator read one paper at Brodie Club and presented one lecture in a series on evolution to the Workers Educational Association.

The foregoing might appear to be one of the Department's most gratifying reports of progress. Saving the Munro Collection for Canada is unquestionably a major accomplishment recorded with deep satisfaction. Nevertheless, the Department is faced with major problems which should be briefly mentioned. First, the Munro Collection must now be permanently housed in proper specimen cabinets. This is an urgent responsibility. Second, although filing space for the research collection is physically possible, it must be added that the Department needs more than twice its present floor space for efficient housing of the bird collections. Further, very inadequate space is available for comparative procedures. In addition to space handicaps, light and ventilation are extremely bad. Cataloguing of specimens is discouragingly in arrears. An alarming situation exists in the Department for which no solution has been found, and which seems probably unlike that of any other Department of the Museum. Birds are, in their own right, subjects of strong public appeal and public interest creates demands on the museum's staff best measured by correspondence and the ringing of the telephone. Services rendered are too specialized to be handled by Information Services of the museum-as-a-whole. Thus the lion's share of time of one member of a staff of two, and some of the time of the other, is absorbed. There is no question of the Department's endorsement of activities on the educational and hobby level, but there is serious question as to how to get on with curatorial work, including use of the collection, one of the most important in the world.

DEPARTMENT OF ICHTHYOLOGY AND HERPETOLOGY*

This was a very busy year for the Department. Briefly the Department has received more specimens, has loaned or given more specimens and has catalogued more specimens (18,000 fishes alone were added to the research collections) and has had more visitors than in previous years. In addition Drs. Scott and Crossman published a joint paper on the fishes of New Brunswick, have another joint paper in press and Crossman has three additional papers in press. The unusual growth of the research collection this year can be attributed first to the availability of extra-clerical help and secondly to the efforts of Dr. E. J. Crossman who supervised the process of incorporating new material into the research collections. The curators are particularly grateful to Mr. John Sweet, Mr. William Charlton, Mr. Allan Wanio and Mr. Hugh McCallum who assisted greatly in the cataloguing of specimens.

Material for the study collections was received from the following organizations: Fisheries Research Board of Canada; Canadian Department of Fisheries; Ontario Department of Lands and Forests; Ontario Department of Planning and Development; National Museum of Canada; Quebec Department of Fisheries; University of Montreal, Biological Bureau; Museum of Zoology, University of Michigan; University of Maine; University of Saskatchewan; Freshwater Research Institute, Drottningholm, Sweden; British Museum (Natural History); Board of Fisheries and Game, Connecticut; Virginia Polytechnic Institute; University of Miami; Florida Game and Freshwater Fish Commission.

A number of distinguished people visited the Department during the year, foremost among these being the President of the University of Toronto, Mr. Bissell and the Vice-President, Mr. Ross. This is the first presidential visit to this Department on record and we felt greatly honoured.

*This Department has recently been divided into the Department of Amphibians and Reptiles and the Department of Fishes.

Some of the other visitors to the Department were: Dr. G. F. M. Smith, G. H. Lawler, A. H. Lawrie, D. P. Scott and N. Watson of the Fisheries Research Board of Canada; Drs. Heming, de Vos, A. Berst and McCrimmon, Ontario Agricultural College; Dr. H. Kleerkoper, McMaster University; Dr. C. C. Lindsay, University of British Columbia; Dr. V. D. Vladykov, Ottawa University; D. E. McAllister, National Museum of Canada; F. M. Atton, Saskatchewan Department of Natural Resources; A. Cushing, University of Saskatchewan; F. L. O'Reilly, Department of Fisheries, Newfoundland; W. A. King-Webster, Department of Fisheries, Trinidad; Drs. J. Moffett, R. Hile, and S. H. Smith, U. S. Fish and Wildlife Services; Dr. T. Wolff, University of Copenhagen, Denmark; Dr. Gunnar Svardson, Institute of Freshwater Fishery Research, Sweden; Dr. Katsuzo Kuronuma, Freshwater Fishery Research Laboratory, Hinomachi, Tokyo, Japan.

Dr. Svardson's visit was particularly noteworthy. This eminent European ichthyologist has published extensively on the coregonid fishes, a group of particular interest to Canadians because of its wide distribution and commercial importance in Canada. With the financial assistance of the Toronto Anglers' and Hunters' Association the Department was able to persuade Dr. Svardson to include Toronto in his itinerary, and to present three lectures during his three-day visit. The lectures were well attended by fisheries workers from Toronto and other nearby universities.

Dr. de Vos of the Ontario Agricultural College brought a group of senior students to the Department in order that they might be more familiar with the research collection.

During the period covered by this report, specimens for study purposes have been on loan or donated to the following institutions: National Museum of Canada; McMaster University; Ottawa University; Institute of Fisheries, University of British Columbia; University of Alberta; Ontario Agricultural College; Museum of Comparative Zoology, Cambridge, Massachusetts; Virginia Polytechnic Institute, Blacksburg, Virginia; Tulane University, New Orleans, Louisiana; University of Arkansas, Fayetteville, Arkansas. This Department has borrowed study material from: National Museum of Canada; Chicago Natural History Museum; Cornell University, Ithaca, New York; Museum of Zoology, University of Michigan; British Museum (Natural History).

The identification of fishes for various Canadian institutions and private persons was, of course, continued. Organizations for which this service was performed are as follows: Federal Department of Fisheries; Fisheries Research Board of Canada; Ontario Department of Lands and Forests; Ontario Department of Planning and Development; Quebec Department of Fisheries and Saskatchewan Department

of Natural Resources. Fish specimens have also been identified for private individuals from various parts of the province.

In the area of research and publication only one paper was completed but much progress was made. Mr. Logier is preparing a revision of the Check-list of Amphibians and Reptiles of Canada and Alaska, which is now out of print. At the request of the Canadian Audubon Society he prepared a popular article entitled "Fear of Snakes" which was published in the Canadian Audubon Magazine. Both the Curator and Associate Curator prepared articles for inclusion in the proposed Museum Magazine, which, of course, has been tabled.

Mrs. Nina McFarland, on extra clerical funds, is preparing distribution maps of fishes for final reproduction. The method being used involves the use of cellulose acetate sheeting and promises to save much labour in the future.

The most important piece of research completed by the Department concerned New Brunswick fishes. Scott and Crossman made a good collection of New Brunswick freshwater fishes in the spring of 1958. As a result of this collection, plus material obtained on previous trips to New Brunswick and a thorough search of the literature, a joint paper was prepared entitled: "The freshwater fishes of New Brunswick, a checklist with annotated notes," which has been published as Contribution No. 51 of the Division's series.

Within the period the following field work has been conducted:

DATE	PLACE	PURPOSE	COLLECTORS
1958 May-June	New Brunswick	General survey	Scott and Crossman
1958 July	Ontario		
	Algonquin Park Frontenac Co.	Coregonid fishes Esocid fishes	Scott Crossman
1958 August	Ontario		
	Point Pelee	General	Scott and Crossman
1959 March-April	U.S.A.		
	North Carolina	Esocid fishes	Crossman

At the request of the Niagara Parks Superintendent, Mr. Logier conducted two snake hunts at Niagara Glen, on May 21 and September 22.

The Curator gave a special informal course on advanced ichthyology to one graduate student, and gave a series of lectures on fishes (15 hours) to Zoology 25. Mr. Logier gave lectures on herpetology (6 hours) to the same group.

Dr. Scott addressed the Biology Club of the University in February and Mr. Logier addressed the Toronto Field Biologists, the Brodie

Club of Toronto and the Toronto Round Table in January, February and March, respectively.

Mr. Logier has been frequently called upon to provide information on snake bite, particularly with respect to rattlesnakes. The Ontario Department of Health and the University of Toronto Medical Library were so provided. In the latter case an exhibit on snake bite protection was installed.

All Curators have taken an active part in the internal workings of the Division. The Curator served on Library and Publications Committees and the Assistant Curator has served on the Exhibits Committee.

Drs. Scott and Crossman attended the annual meeting of the American Society of Ichthyologists and Herpetologists which was held at Indiana State University in August. In January Dr. Crossman attended the annual meeting of the Canadian Committee for Freshwater Fishery Research at Ottawa. Dr. Scott visited the U. S. National Museum for a week during April for the purpose of studying type specimens of coregonid fishes.

DEPARTMENT OF FOSSIL INVERTEBRATES

During July and early August the Assistant Curator was in Peru continuing studies of the Pleistocene marine deposits of the Talara region, particularly in the area of the La Brea tar seeps from which the vertebrate fauna had been collected by the Museum party in the early part of 1958. Collecting of specimens, mainly pelecypods and gastropods, was extended northwards along the coast to Mancora and south as far as the Chira River, thus providing representative assemblages from the modern and raised beaches over a length of coastline of about 120 kms. Preliminary examination of this new material shows some progressive change in the character of the faunas in moving from north to south and it is hoped that more detailed work will throw useful light on the climatic changes that have occurred in this region since Pleistocene times.

In addition to the shells obtained, collections were also made of representative plants native to the area, in order to provide comparative material for use in the identification of the plant debris found associated with the vertebrates in the tar seeps. For a similar purpose, and at the request of Dr. A. G. Edmund, several specimens of modern ducks were taken from modern tar pools.

During the winter the Assistant Curator held an appointment at Queen's University, Kingston, but by spending two days per week in Toronto it was possible to continue with work begun previously. The day-to-day affairs of the Department were ably handled by Mr. John Monteith assisted by Dr. A. G. Edmund as Acting Curator.

Since the return of the Assistant Curator on April 1, work on the Peruvian collections has continued, although slowed down somewhat by the pressure of departmental work. Mr. Monteith has now completed a survey of all the type specimens held in the collection and these are now housed separately.

Enquiries regarding fossils collected by members of the public have been dealt with throughout the year; several of the specimens were

donated to the Museum, including a good example of the Madreporarian coral *Siderastrea* from the Pleistocene of Florida. While the majority of enquiries are from people with no more than a cursory interest in fossils, contact is made, from time to time, with persons who are active amateur collectors. It is to meet the needs of such people that plans are now under consideration for the formation of a Toronto Amateur Palaeontologists Association or field club. Association or affiliation with the Federation of Ontario Naturalists is a possibility. With these same amateur collectors in mind, a small gallery exhibit showing the more common fossils of the Toronto region, with suitable maps and photographs, is currently being planned.

In early June the Assistant Curator accompanied Dr. W. M. Tovell of the Division of Earth Sciences in leading a group from the Federation of Ontario Naturalists to the Craigleath area in a combined ornithological and palaeontological field trip.

The reorganization of the Departmental library, begun last year, has now been completed and it is ready for integration in the catalogue of the Divisional library. Orders have been placed for several new text books, Geological Society of America Memoirs and Special Papers, and U.S.G.S. Memoirs in a continuation of the policy of filling some of the very serious gaps still remaining in the library.

DEPARTMENT OF INVERTEBRATES

It is rather unfortunate that a group of animals so important in man's economy and so rich in species should receive so little attention in our Museum. Lacking sufficient space and staff, our collections have remained static, except for three Orders under study, for the past twenty-five years. We found it necessary to send our mollusc collection on loan to the museum at The University of Michigan for safe keeping and to assist in the research in this group. It is our sincere hope that some day we will be able to obtain sufficient space and personnel to once again carry on research in this field. In the meantime we have a large and important research collection of arachnids and a fine collection of parasites which are not being used in research and are not being properly curated. If curatorial staff is added to the Department of Invertebrates, the studies of arachnids and parasites should take precedence over molluscs.

At the present time two rooms, which should be made available to the Department of Invertebrates, are being used to house part of our research library which likewise is badly in need of extra space. Until the demands of the library have been met it will be impossible to consider expansion of the collection of invertebrates.

Lacking space and personnel the collection has not expanded, except in those orders in which research has been carried out, mainly the Odonata, Orthoptera and Trichoptera. Our activities have, therefore, been confined to research and the publication of the results.

The Assistant Curator has nearly completed his study of the Phryganeidae of the world. The drawings and detailed discussions of the various species have been completed, keys for identification have been prepared and locality records organized. A scientific paper dealing with the relationships of the Asian genus *Phryagnopsis* is ready for publication. A paper dealing with equipment used in rearing Trichoptera has been submitted for publication. In connection with the research programme, collecting trips were made to the east shore of Lake

Superior; to the southern Appalachian mountains to obtain specimens on *Neophylax* for a co-operative work with O. S. Flint of Cornell University; and to Walpole Island on the St. Clair River to obtain larvae and pupae of species of Phryganidae.

The Honorary Curator, Dr. E. M. Walker, has made considerable progress in the preparation of Volume 3 of *The Odonata of Canada and Alaska*. This volume, which is the last in the series, will cover the families Macromiidae, Corduliidae and Libellulidae. An article on dragonflies was prepared for the forthcoming edition of the *Encyclopaedia Britannica*.

The Curator completed the manuscript on the Monarch butterfly and, except for final proof-reading and figure designations, it is now ready for submission to University of Toronto Press. The publication of this work is being financed by the Carling Breweries Limited which firm has, for the past many years, assisted us immeasurably in making our scientific findings available to the public in printed form.

Identifications and other information on various invertebrates was given to numerous individuals, commercial firms and government departments. Collections of Trichoptera were identified for the Canadian Department of Agriculture and the University of Western Ontario.

Instruction on the identification and life-history of various species of injurious insects was given by the Assistant Curator as part of a training programme presented by the Ontario Department of Health.

We wish to acknowledge the loan of type material from the Stockholm Museum and the Zoological Museum of Humboldt University in Berlin; also, a collection of Trichoptera from Alaska donated by Dr. G. E. Bell of the University of Alberta.

DEPARTMENT OF ART AND EXHIBITS

As on other occasions in the past this Department approached the beginning of the Museum year 1958–9 with a staff inadequate in numbers to carry out its committed programme. On June 30, 1958 the Associate Chief, Mr. A. Reid had resigned his position with the Museum to join a commercial firm. This resignation came at a time when the Department was obligated to a heavy programme supported by an outside sponsor, viz. the Gallery of Modern World Reptiles. Although there was no deadline for this project it was nonetheless considered imperative that it be completed as soon as possible without sacrificing the quality of the material to be exhibited.

Zoological display artists and technicians of diversified talent are scarce and the good ones beyond our ability to pay. It was not an opportune time to commence the training of new and inexperienced help. These conditions have led to the innovation of a somewhat new plan of procedure for the Department.

In the past, Art and Exhibits has relied upon a small permanent staff (never numbering more than three) to undertake the preparation of the many and varied objects necessary in modern Life Science displays. The staff was required, therefore, to engage in taxidermy, moulding and casting, wax and plastic work, modelling in clay, mache and other media, background painting, scientific illustration, designing and assembling of exhibits and even, on occasion, embedding and impregnation techniques and glass-blowing. This constitutes a range of techniques that, each to be done well, would require a staff of at least a half-dozen specialists. Since it is not possible, financially, to indulge in this kind of luxury it was decided that the permanent staff would not be increased at this time, but that greater dependence should be placed on part-time specialist assistance and on purchases from the growing number of commercial firms which are now prepared and equipped to furnish museum quality display specimens and exhibits.

The implementation of this system has been achieved only in part.

It was not found possible to obtain exhibition specimens of reptiles comparable to the calibre of those being produced in the R.O.M. by Mr. Sternberg and Mr. Gatti. Other materials, such as plastic botanical accessories, have been purchased and have proved to be eminently satisfactory.

Meanwhile, progress on the gallery of reptiles has continued. All of the showcases to house the exhibits have been constructed. The walls and ceilings of the gallery have been redecorated and much of the equipment for the several "activated" exhibits has been built or purchased.

As to the reptiles, the programme called for the inclusion of 108 specimens each to be obtained, moulded, cast and coloured in such a way as to demonstrate some phase of reptilian biology. To date, 98 specimens have been received, photographed, positioned and preserved preparatory to moulding. Moulds have been made from 85 of these and 53 casts have been taken. Twenty-nine are coloured and ready for installation in the gallery.

Among those processed during the year were a 14-foot anaconda and an 18-foot reticulate python. Both of these are completed and ready for display. The python mould was probably the largest ever undertaken by the Department and required some 700 lb. of dental plaster. The total weight of this mould when supported by heavy irons, water-soaked and filled with 16 gallons of liquid latex mixture during the casting operation was close to three-quarters of a ton. The Division's Chief Technician, Mr. Hornell, graciously made available his laboratory, equipped with heavy block and tackle, for this and other weighty operations.

A notable acquisition consisted of 22 specimens of reptiles which were casualties in the disastrous flood which inundated the reptile house of the Cleveland Zoo in January 1959. These were received through the good offices of Mr. William Scheele, director of the Cleveland Museum of Natural History, who had visited the R.O.M. just a few weeks previously and was acquainted with our programme. Through the efforts of Mr. Cameron of Publicity and Information Services, the Carling Breweries Ltd. financed a flight by Mr. Gatti to Cleveland to photograph, pack and ship the dead specimens so that they arrived in Toronto in excellent condition. Included in the shipment were a huge 15-foot king cobra, magnificent specimens of gaboon viper and river jack, Indian cobras, golden monitor, ball python, Cuban boa and an enormous Mexican rattlesnake. Moulds have been made of all of these and others. Mr. Sternberg and Mr. Gatti have made from the Mexican Rattler what is perhaps the most remarkable mould ever produced at the R.O.M. The specimen will be shown in the striking position with mouth fully open and fangs erected.

It should be mentioned that with the exception of the material from Cleveland virtually all of our specimens have been received alive. This has enabled the staff to observe and photograph the living animals so that greater accuracy in reproducing them has been obtained. Mr. Gatti has secured a very remarkable series of pictures, in black and white and in colour of a wide variety of world forms. In some instances high-speed electronic flash pictures were necessary where the movements of certain species were too rapid to be properly observed by eye. The bipedal running gait of the basilisk was photographed on the studio floor so that correct leg positions could be obtained in the casts. Similarly the action of the “sling-shot” tongues of the African chamaeleons was recorded, revealing that the tongue was not only adhesive but actually prehensile. This fact will be shown in the new gallery. The chamaeleons were obtained direct from Nairobi through Dr. C. S. Churcher’s interest in the exhibit.

The Department has received from the Deaton Nature Studios of Washington reproductions in plastic of virtually all of the botanical accessories that will be required for the gallery. These have been specially made to our instructions and specifications, largely from preserved material collected by the 1957 Trinidad expedition. The reproductions are of the highest quality and have the unique advantage that the individual leaves may be bent or shaped at will without damage.

Mr. John Walter has been employed on an extra-clerical basis and has completed a large mural “de-bunking” the commonest misapprehensions about reptiles—from hoop snakes to Ogopogo—and also featuring some “stranger-than-fiction” truths. In addition to assisting with some of the larger moulding operations and colouring several casts, Mr. Walter has prepared a series of designs for the various panels in the display and also has worked out a colour progression for the whole series of exhibits so that the colour scheme will be co-ordinated throughout and will uniformly complement the general *décor* of the gallery.

Towards the end of the year, the Head of the Life Sciences Division appointed a Curatorial Committee to deal with the many and varied problems facing the Department of Art and Exhibits. It is felt that the guidance of this committee will greatly assist the exhibition programme.

LIBRARY

The aim of librarianship is the bringing together of the reader and the book or piece of information. To achieve this goal the librarian secures, organizes and makes material available.

The Librarian of this Division is embarking on the first two steps mentioned above. It was decided to recatalogue the collection according to standard library methods and to classify the books using the Library of Congress classification. The University of Toronto Library is also adopting this system. Our library is being revised to give, in the future, special library services to the staff of this Division and also to make the collection available to all students interested in the field of biology.

The largest amount of our material is serial publications. Therefore, it was decided to recatalogue this material first. Three divisions were made: Foreign publications; Canadian, United States and British government publications; and serials or periodicals. In order to have the periodical sets as complete as possible, all issues of serials were recalled from departmental offices. Such material will in the future be shelved in the library. At the recataloguing of the serial publications proceeds, an attempt is being made to secure some of the missing issues.

Reprints will no longer be considered as library items. In the future, reprints will be sent to the department concerned and treated as departmental possessions.

The Librarian is attempting to enlarge gradually the general reference material. Included in this is a map collection, which has been greatly enhanced in value by a large number of topographical sheets.

In setting up a library many routine practices such as exchanges, book equipping, acknowledgements, etc., have to be established and outlined. These procedures are being developed at this time.

To show the growth and use of the library now and in the future, the following statistical figures are provided for the period from June 1, 1958 to May 1, 1959.

CIRCULATION

Items taken out on loan	483
-------------------------	-----

REFERENCE

Locating items within the library for readers	368
Quickly answered questions	87
Requiring considerable research	48

INTERLIBRARY LOAN

Lending	14
Borrowing	98

ACCESSIONS

Books	70
Serials (received by subscription and exchange)	361

A permanent library committee was formed during the past year. This committee will have a reciprocal benefit; the Librarian will learn the needs and interests of those using the library, and the staff will become familiar with library problems. The committee will govern the purchase of library material and will assist the Librarian in establishing library principles. The Librarian wishes to thank the committee and its chairman for its invaluable suggestions and guidance over the past year.

The Librarian has received valuable help from members of her profession both in Toronto and in libraries throughout Canada and the United States. She is very grateful for all the time and advice these librarians have given willingly.

The sympathetic understanding of the staff of this Division has greatly assisted the Librarian. The reorganization of a library is always a great inconvenience to all persons using the collection. It is hoped that within a few years, this confusion will be proven worth while by the amount of service the library will be able to provide.

CHIEF TECHNICIANS

CHIEF TECHNICIAN OF ZOOLOGY: *E. H. Taylor*

The Chief Technician in Zoology is primarily responsible for the preparation of specimens for the reference collections of the Departments of Mammals and Birds. The variety and total of the preparations completed during the year are shown by the following: Mammals—235 skulls; 70 skeletons; 10 skins. Birds—20 skeletons; 71 skins; (7 eggs) plus restoration (de-greasing) of 2 skins. Co-operative work for other departments include the preparation of 1 skeleton (wolf), the skull of a goat (domestic) and bones of fowl (domestic) for Vertebrate Palaeozoology. In addition, a conservation project concerned with a

raw hide (beaver) was completed for the Division of Art and Archaeology. Also special assistance was rendered the Departments of Mammals and Herpetology during the summer period by making specimens (marsupials and lizards) available to a graduate student in the University's Department of Anatomy.

Certain public relations tasks were carried out during the year by the Chief Technician in Zoology, as follows: The Downsview Collegiate Biology Club was introduced to the work of the laboratory; a talk on the preparation of zoological material was given to the staff of the museum-as-a-whole; a general talk on Ontario animals was given to the Saturday Morning Club which consists of about 150 children. Also, one television appearance was made on C.B.C.'s Tabloid.

Estimates and plans in connection with the installation of new equipment in the laboratory were attended to during the year. These had to do with the beetle vault, laboratory tables, stove, etc.; these changes with other refurbishing having been completed.

Mention should be made of maintenance of the gallery aquaria which by special arrangement falls under the care and direction of the Chief Technician. Among the special displays of the period were the following: Pirhana, Maskinonge, Smelt and Lamprey. The Lamprey spawned during the exhibit and by doing so contributed a worthwhile number of eggs and larval specimens for the research collection of the Department of Fishes. A new service truck for this work was designed and put into service and a portable turbine filter pump was installed.

CHIEF TECHNICIAN OF PALAEOZOOLOGY: *R. R. Hornell*

The entire year was spent preparing material collected by the 1958 expedition to the tar pits of La Brea, Peru. Nine of the twenty crates of bones and blocks have now been opened and much excellent material has been cleaned and restored. The collection consists mainly of three classes of material: Individual bones partly cleaned in the field, large blocks of matrix containing masses of closely packed bones, and plaster-wrapped blocks containing skulls and other delicate specimens.

The Chief Technician has concentrated on the latter since they are of prime research and exhibition value. About sixty numbered specimens have been recorded, including skulls of two sabre-tooth cats, one "lion," a mastodon, several wolves and a fox. A fine skull of a giant ground sloth, the only one to appear as yet, is currently being extracted from a large and very hard block of oxidized pitch. The presence of dozens of other bones in close contact makes the work particularly slow and painstaking. Other noteworthy specimens include two lower jaws of *Mastodon*, one of a horse, and numerous jaws of wolves, foxes and large cats.

The Chief Technician assisted in the preparation of the new Peru

gallery. Several of the finer specimens in the tar pit collection were specially mounted for exhibit, and replicas of a modern duck caught in a tar flow, and of a block of matrix as found in the field were constructed.

Because of the importance and abundance of the Peruvian material, work on other projects has been suspended. It is expected that at the present rate, at least two more years will be required to complete cleaning of the present collection. The need for another preparator is obvious. No other major museum has so small a preparation staff, and the impressive accomplishments of the past were possible only because of the larger staff then available.

STAFF PUBLICATIONS

BAILLIE, JAMES L.

- 1958. Pomarine jaeger at Niagara Falls. *Prothonotary*, vol. 24, no. 3, pp. 14–15.
- 1958. Six old yet new Ontario breeding birds. *Ont. Field Biol.*, no. 12, pp. 1–7.
- 1958. Western tanager an Ontario bird. *Ont. Field Biol.*, no. 12, pp. 28–29.
- 1958. James Alexander Munro. *Roy. Ont. Mus. Staff Bull.*, Dec., pp. 2–3, mimeo.
- 1959. Christmas bird census—1958, Toronto, Ont. *Can. Field-Nat.*, vol. 73, no. 1, p. 41.
- 1959. [Review] 1,001 questions answered about birds. By Allan D. and Helen G. Cruikshank, Dodd, Meade and Co., N.Y., *Fed. Ont. Nat. Bull.* 83, p. 33.

CROSSMAN, E. J. AND P. A. LARKIN

- 1959. Yearling liberations and change of food as affecting rainbow trout yield in Paul Lake, British Columbia. *Trans. Amer. Fish. Soc.*, vol. 88, no. 1, pp. 36–44.

PETERSON, R. L.

- 1958. [Review] Palmer's fieldbook of mammals. By E. Lawrence Palmer, E. P. Dutton and Co., N.Y., *Journ. Wildlife Mgt.*, vol. 22, no. 3, pp. 327–328.

SCOTT, W. B. AND E. J. CROSSMAN

- 1959. The freshwater fishes of New Brunswick: a checklist with distributional notes. *Roy. Ont. Mus., Div. Zool. and Palaeo., Contrib.* no. 51, pp. 1–46.

SNYDER, L. L.

- 1958. Collecting birds and conservation. *Ont. Field Biol.*, no. 12, pp. 16–18.
- 1958. [Review] *Discovering nature*. By Charlotte Orr Gantz, Charles Schribner's Sons, N.Y., *Fed. Ont. Nat. Bull.* 83, p. 34.



ROM